



**UNITED STATES**  
**NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

David Pierce  
Closure Manager  
Grants Reclamation Project  
Homestake Mining Company of CA  
P.O. Box 98/Highway 605  
Grants, NM 87020

**SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION REVIEW OF HOMESTAKE MINING COMPANY OF CALIFORNIA'S REQUEST TO START POST-CLOSURE MONITORING FOR THE WESTERN PORTION OF THE NORTH-OFFSITE AREA DATED 15 AUGUST 2017, DOCKET NO. 040-08903, LICENSE NO. SUA-1471**

Dear Mr. Pierce:

By letter dated 15 August 2017,<sup>1</sup> Homestake Mining Company of California (HMC) requested that the U.S. Nuclear Regulatory Commission (NRC), U.S. Environmental Protection Agency (EPA), New Mexico Environment Department (NMED), and New Mexico Office of the State Engineer (OSE) (the Agencies) review their proposal to start post-closure monitoring for the western portion of the North-Offsite area. HMC's original request, "Request to Begin Post-Closure Monitoring of the Western Portion of the North-Offsite Area" was submitted to NMED on December 8, 2015.<sup>2</sup> NMED responded to that request in a letter dated May 22, 2017.<sup>3</sup> HMC's 15 August 2017 request incorporates responses to the NMED May 22, 2017, letter.

The NRC staff did not initially review this August 15, 2017, request due to the submission of the Groundwater Monitoring Plan License Amendment Request<sup>4</sup> submitted to the NRC for review and approval dated November 20, 2017. However, in 2019, HMC staff verbally requested that the NRC staff review the August 15, 2017, submission.

The NRC, in coordination with the Agencies, have determined that it is premature to start post-closure monitoring for the western portion of the North-Offsite area. The NRC staff review is enclosed.

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<sup>1</sup> Agencywide Documents and Management System (ADAMS) Accession No. ML17236A260

<sup>2</sup> ADAMS Accession No. ML20062A883

<sup>3</sup> ADAMS Accession No. ML20062B320

<sup>4</sup> ADAMS Accession No. ML18018A102

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions regarding this matter, please contact me at 301-415-7777, or via email at [ron.linton@nrc.gov](mailto:ron.linton@nrc.gov).

Sincerely,

Ron C. Linton, Project Manager  
Uranium Recovery and Materials  
Decommissioning Branch  
Division of Decommissioning, Uranium Recovery  
and Waste Programs  
Office of Nuclear Material Safety  
and Safeguards

Docket No.: 040-08903  
License No.: SUA-1471

Enclosure: NRC staff review

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SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION REVIEW OF HOMESTAKE  
MINING COMPANY OF CALIFORNIA'S REQUEST TO START POST-CLOSURE  
MONITORING FOR THE WESTERN PORTION OF THE NORTH-OFFSITE AREA  
DATED 15 AUGUST 2017, DOCKET NO. 040-08903, LICENSE NO. SUA-1471.  
**DATE**

**DISTRIBUTION:** B. Pham, NMSS H.Gepford, RIV R.Evans, RIV  
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U.S. NUCLEAR REGULATORY COMMISSION STAFF REVIEW OF THE HOMESTAKE  
MINING COMPANY OF CALIFORNIA REQUEST TO START POST-CLOSURE  
MONITORING FOR THE WESTERN PORTION OF THE  
NORTH-OFFSITE AREA DATED 15 AUGUST 2017

GRANTS RECLAMATION PROJECT

DOCKET NO: 040-08903  
LICENSE NO: SUA-1471

## 1.0 BACKGROUND

By letter dated August 15, 2017,<sup>1</sup> Homestake Mining Company of California (HMC or the licensee) requested that the U.S. Nuclear Regulatory Commission (NRC), U.S. Environmental Protection Agency (EPA), New Mexico Environment Department (NMED), and New Mexico Office of the State Engineer (OSE) review their proposal to start post-closure monitoring for the western portion of the North-Offsite area. HMC's original request, "Request to Begin Post-Closure Monitoring of the Western Portion of the North-Offsite Area" was submitted to NMED on December 8, 2015.<sup>2</sup> NMED responded to that request in a letter dated May 22, 2017.<sup>3</sup> HMC's 15 August 2017 request incorporates responses to the NMED May 22, 2017, letter.

In the request, HMC proposed two years of quarterly monitoring of seven alluvial wells in the western portion of the North Off-site area at the Homestake Grants Reclamation Project (Grants) site. These seven wells - 541, 551, 647, 649, 654, 899, 996 - are shown in green in Figure 1 below. HMC further discussed that after the agencies (i.e., the NRC, EPA, NMED, and OSE) agree that adequate post-closure monitoring has been done for the western portion of the North-Offsite area, HMC will propose abandonment of the monitoring wells.

The NRC staff did not initially review this August 15, 2017, request due to the submission of the Groundwater Monitoring Plan License Amendment Request (LAR)<sup>4</sup> submitted to the NRC for review and approval dated November 20, 2017. However, in 2019, the licensee verbally requested that the NRC staff review the August 15, 2017, submission.

## 2.0 NRC STAFF EVALUATION

The licensee is required to establish and implement a compliance monitoring program as stated in Title 10 *Code of Federal Regulations* (CFR) Part 40, Appendix A, Criterion 7A:

*Once groundwater protection standards have been established pursuant to paragraph 5B(1), the licensee shall establish and implement a compliance monitoring program. The purpose of the compliance monitoring program is to*

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*determine that the hazardous constituent concentrations in groundwater continue to comply with the standards set by the Commission. In conjunction with a corrective action program, the licensee shall establish and implement a corrective action monitoring program. The purpose of the corrective action monitoring program is to demonstrate the effectiveness of the corrective actions. Any monitoring program required by this paragraph may be based on existing monitoring programs to the extent the existing programs can meet the stated objective for the program.*

By letter dated November 20, 2017, HMC submitted a Groundwater Monitoring Plan LAR to the NRC for review and approval. The Groundwater Monitoring Plan LAR would amend the previously approved compliance monitoring plan at the Grants site. The November 20, 2017, Groundwater Monitoring Plan LAR included the seven wells that the licensee proposed to start post-closure monitoring in its August 17, 2017, request. In the NRC staff request for additional information (RAI) RAI #4, dated September 28, 2018,<sup>5</sup> in response to HMC Groundwater Monitoring Plan LAR, the NRC staff requested the following information:

*Propose and justify a monitoring period after the cessation of corrective actions to verify that contaminant concentrations do not rebound after groundwater restoration activities have been completed. As part of that response, please provide a discussion of HMC's strategy to consolidate the groundwater monitoring program as restoration of the groundwater is completed.*

By letter dated October 18, 2018,<sup>6</sup> HMC responded to the NRC staff's September 28, 2018, RAI with the following comment:

*HMC plans to monitor the compliance wells in an area where the restoration is deemed to be completed at a quarterly frequency for two years after cessation of corrective action to verify stability of the water quality. The samples will be analyzed for all site standard constituents. An evaluation of the stability of the groundwater quality in the restored area will be conducted. This evaluation of the groundwater quality stability will include a determination if these compliance monitoring wells can be removed from the groundwater monitoring program. Presently, the seven wells in the Western Portion of the North Off-Site Wells are being sampled at a quarterly frequency for two years for all alluvial groundwater site standard constituents. An evaluation is expected to be conducted and submitted in 2020 to determine if these wells should be removed from the compliance monitoring program.*

The staff notes that the licensee has stated in its October 18, 2018, response to NRC RAI that it plans to further evaluate the seven wells in the Western Portion of the North Off-Site in 2020.

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<sup>5</sup> ADAMS Accession No. ML18214A218

<sup>6</sup> ADAMS Accession No. ML18298A019

In the NRC staff Groundwater Monitoring Plan LAR Safety Evaluation Report dated November 12, 2019,<sup>7</sup> NRC staff discussed its concern regarding rebound of contaminant concentrations in the groundwater monitoring well network after the cessation of restoration activities:

*Groundwater restoration activities have the potential to decrease contaminant concentrations in the short term, followed by a subsequent increase in contaminant concentrations (i.e., rebound) after the cessation of restoration activities. Accordingly, a monitoring period may be established after the cessation of restoration activities to demonstrate complete restoration of the aquifer(s). The LAR did not provide discussion on the strategy to consolidate the groundwater monitoring well network after groundwater restoration has been completed in areas with contamination nor did it include discussion of a proposed monitoring period after the cessation of corrective actions. Accordingly, additional information was requested by NRC staff on September 28, 2018, regarding Homestake's proposed consolidation strategy and restoration monitoring period.*

The NRC staff further stated in the Groundwater Monitoring Plan LAR Safety Evaluation Report:

*The NRC staff has determined that HMC's suggested monitoring program after the cessation of corrective actions is acceptable, which is consistent with New Mexico Environment Department's (NMED) requirements found in Title 20, Environmental Protection, Chapter 6, Water Quality, Part 2, Ground and Surface Water Protection, Section 20.6.2.4103, Abatement Standards and Requirements. However, the monitoring program for individual wells after the cessation of corrective actions may need to be considered on a case-by-case basis in some instances. For example, the removal of downgradient monitoring wells in an area where restoration activities have ceased might not be justified if upgradient restoration activities are affecting the downgradient wells. In response to HMC's proposed 5-spot injection pattern, the NRC staff discussed in a letter dated April 2, 2019,<sup>12[8]</sup> that HMC's restoration activities appear to be unbalanced in that more water was being injected into the subsurface than collected, which would result in dilution. For compliance wells to be removed from the license, HMC would need to demonstrate that if there are any upgradient restoration activities, then those restoration activities are not resulting in dilution at these downgradient wells. The NRC staff expects the licensee to continue monitoring all compliance wells as approved in Appendix B and Appendix C of this report, which will be tied to the license SUA-1471 by the licensee's October 8, 2019, submission, until the NRC staff approves a license amendment to remove compliance wells no longer deemed necessary. The NRC staff expects that a network of groundwater monitoring wells, which may be a subset of these compliance monitoring wells, will be established for long-term surveillance. Therefore, not every well that meets the compliance standard in a specific area or aquifer should be removed. A subset of specific wells should be maintained and sampled, possibly at a reduced frequency or for a smaller set of contaminants, with the anticipation that this subset will be used for long-term surveillance when the site eventually is turned over to a long-term custodian for perpetual care and maintenance.*

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<sup>7</sup> ADAMS Package Accession No. ML19217A352

<sup>8</sup> ADAMS Package Accession No. ML19050A016

As shown in Figure 2 below, which was adapted from HMC's Groundwater Monitoring Plan LAR dated November 20, 2017, the seven wells proposed by HMC for post-closure monitoring are the compliance monitoring wells for the western portion of the North-Offsite area shown in the Groundwater Monitoring Plan LAR. The Groundwater Monitoring Plan LAR was approved by the NRC by license amendment dated November 12, 2019.<sup>9</sup> Although these wells currently meet the groundwater protection standards for uranium (i.e., <0.16 mg/L) and other constituents of concern, the NRC, in coordination with the Agencies, are unable to determine that these concentrations are representative of steady-state conditions and that the corrective actions have been fully effective. The injection wells and lines, shown in green in Figure 3 below, could result in dilution downgradient as the collection wells may not capture all of the injectate, which consists of reverse osmosis and zeolite treated-water and fresh water from the San Andres Glorietta aquifer. Therefore, the observed concentrations in this monitoring area might not be representative of the long-term state of the alluvial groundwater in the western portion of the North-Offsite area. Additionally, a Groundwater Corrective Action Plan (GCAP) LAR for the Grants site was submitted to the NRC for review and approval on December 18, 2019.<sup>10</sup> Initial review of the GCAP shows corrective actions at the Grants site extending into 2035 for final completion. Accordingly, the NRC, in coordination with the Agencies, have determined that it is premature to start post-closure monitoring for the western portion of the North-Offsite area.

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<sup>9</sup> ADAMS Package Accession No. ML19217A352

<sup>10</sup> ADAMS Package Accession No. ML19354B960

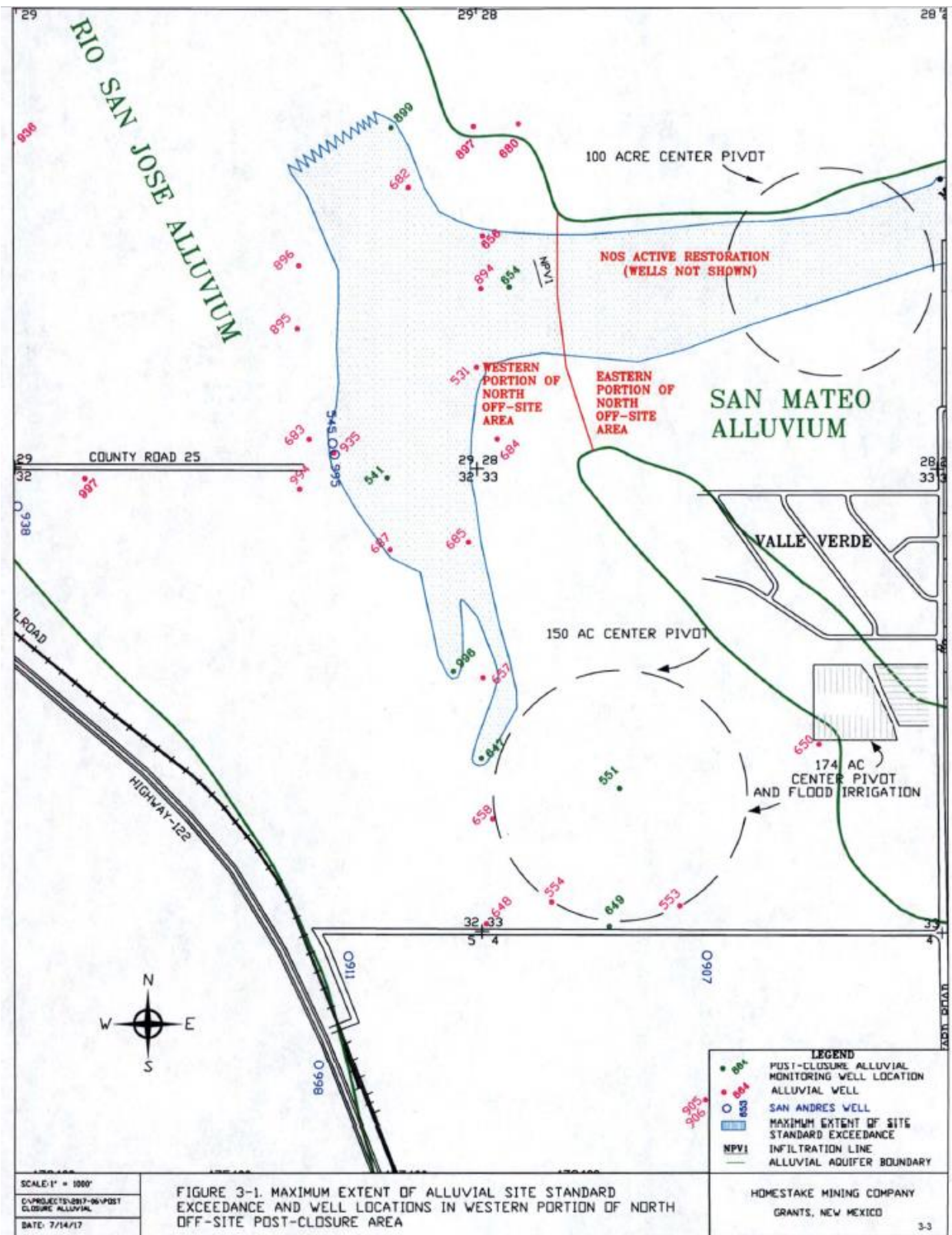


Figure 1. Well Locations in Western Portion of North-Offsite Area (adapted from HMC document dated August 15, 2017)



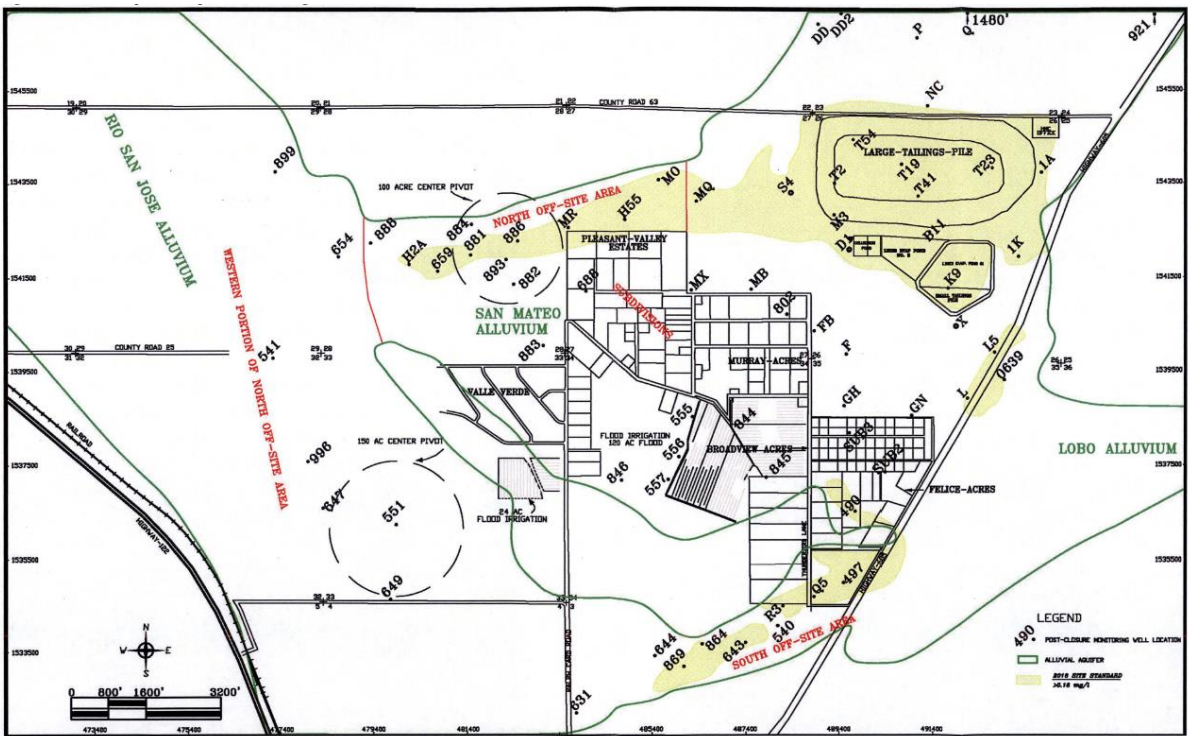


Figure 2. Alluvial Aquifer Compliance Monitoring Well Locations (adapted from HMC's Groundwater Monitoring Plan License Amendment Request)

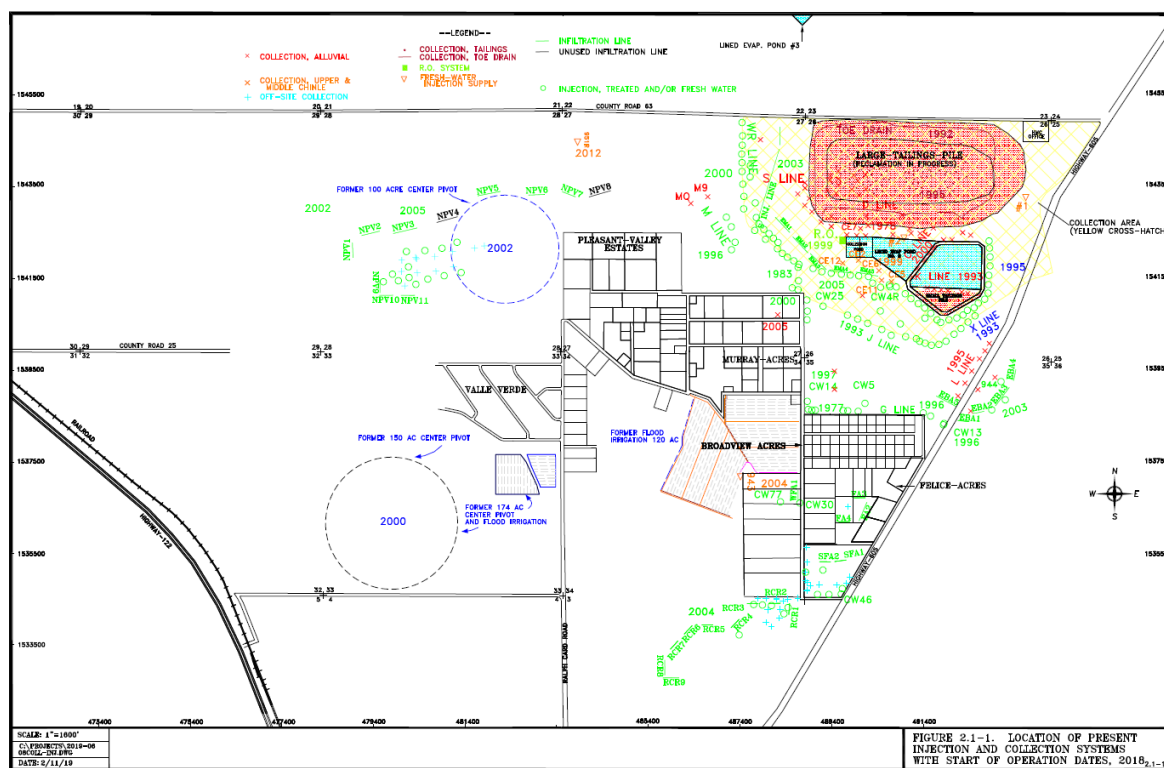


Figure 3. Alluvial Injection and Extraction Wells and Injection Lines (adapted from HMC's 2018 Annual Monitoring Report)